"FORMULATION AND EVALUATION OF MULTIPURPOSE HERBAL CREAM"

A RESEARCH PROJECT

Submitted by

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VIVEKANAND COLLEGE, KOLHAPUR

(AN EMPOWERED AUTONOMOUS INSTITUTE)

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Multipurpose Herbal Cream

"Dissemination of Education for Knowledge, Science and Culture"

- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

VIVEKANAND COLLEGE, KOLHAPUR

(AN EMPOWERED AUTONOMOUS INSTITUTE)

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CERTIFICATE

OF

RESEARCH PROJECT COMPLETION

This is to certify that Ms. **KARISHMA UMESH VAST** studying in M. Sc. Part II Microbiology at Vivekanand College, Kolhapur (Empowered Autonomous) has sincerely completed research project work entitled **"FORMULATION AND EVALUATION OF MULTIPURPOSE HERBAL CREAM"** during academic year 2024-25.

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Multipurpose Herbal Cream

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INDEX

- **List of Tables**
- **List of Photograph**

List of Tables

List of Photographs

CHAPTER 1: INTRODUCTION

INTRODUCTION

Creams are semi-solid dosage forms administered topically to the skin, eyes, or mucous membranes, such as rectal, vaginal, or nasal surfaces, for medicinal, preventive, or cosmetic purposes. They are versatile semi-solid emulsions, consisting of either oil dispersed in water (o/w) or water dispersed in oil (w/o). Carefully crafted for external application, these formulations are fortified with emulsifying agents to ensure stability. Designed to provide therapeutic benefits to the skin, they offer hydration, moisturization, protection, and efficient delivery of active ingredients. (Jayita Roy, 2024)

The skin is the body's largest organ, composed of water, protein, fats, and minerals. It acts as a shield, protecting us from microbes and regulating internal heat levels. Nerves in the skin help detect sensations like hot and cold. The skin is made up of three layers: the epidermis, dermis, and hypodermis. Keratin, a protein found in skin cells, helps maintain the structure of the skin by binding cells together to form a durable framework. (Suchita Gokhale, 2022)

Creams are classified based on their function, properties, and type of emulsion:

1. Makeup Creams (o/w emulsion):
   - Vanishing cream
   - Foundation cream.
2. Cleansing Products (w/o emulsion):
   - Cleansing cream
   - Cleansing lotion
3. Winter Creams (w/o emulsion):
   - Cold cream
   - Moisturizing cream
4. Multipurpose Creams:
   - All-purpose cream
   - General cream
5. Hand and Body Care Products

(Muggu Sankara Bhavani, 2023)

❖ **Ideal Properties of a Cream:**

1. Enhanced spreadability and ease of application.
2. Improved appearance.
3. Melting or liquefying texture.
4. Pore-refining and flushing action.
5. Emollient film formation.
6. Prevention of dryness.

(Jayashree Modi,2024)

Herbal creams are cosmetic products formulated with a combination of synthetic ingredients as a base, along with one or more herbal ingredients to provide cosmetic benefits. These creams offer various advantages, such as healing, smoothing, conditioning, and enhancing appearance, due to the beneficial properties of herbal ingredients. These properties include anti-aging effects, antioxidant activity, and more.

The purpose of the current study was to develop the herbal cream with anti-fungal, anti-bacterial, and anti-acne properties, as well as moisturizing, nourishing, and lightening effects, aimed at treating a variety of skin conditions. (Supriya Bhosale, 2024)

Herbal creams have been used for centuries as natural remedies for various skin ointments and cosmetic purposes. Derived from plant-based ingredients, they provide a holistic approach to skincare, harnessing therapeutic properties to nourish, protect, and rejuvenate the skin. (Jayashree Modi,2024)

❖ **Types of Herbal Creams:**

Herbal creams are divided into two main types:

1. Oil-in-Water (O/W) Cream:

This type consists of small oil droplets that are dispersed in a continuous water phase. Here, water is the primary component that holds everything together, while oil is distributed throughout in tiny drops. This type of mixture is known as an oil-in-water (O/W) cream.

2. Water-in-Oil (W/O) Cream:

In this type, small water droplets are dispersed in a continuous oil phase. Oil serves as the main component that binds everything, while water is present as small drops. This type of mixture is called a water-in-oil (W/O) cream. (Jayita Roy, 2024)

❖ History of Herbal Creams:

Herbal creams have a long and rich history, deeply rooted in ancient medicinal practices that relied on natural plant ingredients to treat various ailments. The use of herbs in topical preparations dates back thousands of years, with evidence of this practice found in ancient cultures such as Egypt, China, India, Greece, and Rome.

The Egyptians were among the first to create topical ointments and creams using herbal extracts. They blended herbs like aloe vera and different plant oils to make salves that helped heal skin wounds, burns, and infections. Even Cleopatra was known for her skincare routines, which included herbal ingredients.

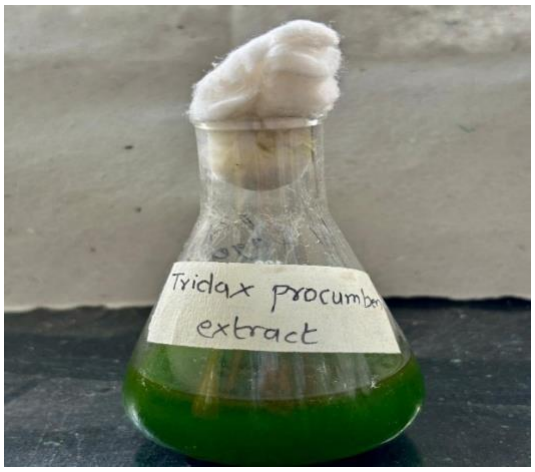
In India, the Ayurvedic system, which dates back over 5,000 years, is one of the oldest and most comprehensive natural healing systems. Ayurvedic practitioners created herbal creams using ingredients like turmeric, sandalwood, neem, tulsi and mint. These preparations were used for wound healing, soothing skin inflammation, and treating various diseases.

Cosmetics are products commonly used to beautify and purify the skin. The term "cosmetics" originates from the Greek word "kosméticos," meaning "to adorn." Herbal cosmetics are a type of product specifically designed to enhance and beautify human appearance while nourishing and moisturizing the skin. (Anshul Sharma, 2023)

❖ Ingredients of Herbal Cream:

1. *Tridax Procumbens*:

Tridax procumbens is a medicinal plant from the Asteraceae family, commonly used in Ayurveda.It is an annual or perennial plant native to Central and South America, and it also grows widely across India as a weed. It is known as "Coat Buttons" in English, "Jayanti Veda" in Sanskrit, and "Kansari" in Hindi.The leaves of *Tridax procumbens* have antiseptic, insecticidal, and anti-parasitic properties.



Photograph No. 1: *Tridax procumbens* extract

2. Turmeric (*Curcuma longa*):

Turmeric, part of the *Zingiberaceae* family, is best known as a spice used in Asian cuisine, especially in curry and mustard. It is also traditionally used in Indian communities as a topical burn treatment. The active compound, curcumin (diferuloylmethane), has significant anti-inflammatory properties and promotes wound healing and antioxidant benefits.Turmeric paste is applied as an antiseptic and for skin nourishment. (Bhuvanchandra Joshi, 2022)

Photograph No. 2: Turmeric

Benefits of Turmeric for Health:

1. Natural anti-inflammatory properties
2. Strong antioxidant effects
3. Enhanced skin health
4. Acne treatment
5. Support for wound healing
6. Antimicrobial Properties. (Somnath S Daykhar,2023)

3. **Aloe Vera**:

Aloevera is known as the "Lily of the Desert" or the "Plant of Immortality," aloe vera is a versatile ingredient for skincare. It is recommended for treating sunburn, minor burns, wrinkles, insect bites, skin irritations, minor cuts, and abrasions.

Research highlights that aloe vera gel possesses remarkable healing properties, effectively treating wounds, ulcers, and burns by creating a protective layer over the affected area. Additionally, it clears blemishes, shields the skin against infections, and reduces wrinkles. Aloevera is also beneficial for dry skin prone to inflammation, providing a bacteriostatic effect. (Bhuvanchandra Joshi, 2023)

Photograph No. 3: Aloe vera

Benefits of Aloe Vera for Facial Skin:

Aloe vera is particularly useful for facial skin care due to its:

1. Anti-inflammatory properties that alleviate pain, swelling, and soreness of wounds or injuries.
2. Cooling effect on rashes or sunburn.
3. Ability to maintain skin health, imparting a natural shine.
4. Rich moisturizing properties, aiding in dead cell removal. (Somnath S Darkhar, 2023)

4. Beeswax:

Beeswax is widely used in herbal cosmetics for its medicinal and nutritional benefits. It serves as an emulsifier, emollient, film former, and perfuming agent. Suitable for all skin types, beeswax forms a protective barrier on the skin. Natural Ingredients for Skin care.

5. Pudina (Mint):

Pudina, also known as mint, is a popular ingredient in many herbal creams and beauty products due to its numerous health benefits. The leaves of mint contain anti-inflammatory, antibacterial, and antioxidant properties, which help:

Soothe acne and skin irritations, reduce redness and puffiness, Protect the skin from infections Mint leaves also contain salicylic acid, which can control oil production and mildly exfoliate the skin, making it ideal for acne-prone skin. Furthermore, the pleasant aroma of mint refreshes the skin, providing a calming and cooling sensation. (Zainabzaki, 2020)

Photograph No. 4*: Mentha arvensis* (mint) extract

6. Rose Water:

Rose water has been a staple in beauty products for thousands of years. It helps improve skin complexion and reduces redness. With its anti-inflammatory properties, rose water can soothe skin irritation and puffiness, leaving the skin feeling refreshed and rejuvenated

7. Glycerin:

Glycerin is a clear, odorless, colorless liquid derived from vegetable oils. It is known for its hydrating properties; glycerin has long been popular in skincare due to its ability to:

1. Aid in long-lasting hydration. improve skin elasticity. help repair the skin’s protective barrier by forming a moisture layer.
2. These natural ingredients offer multiple benefits and can be valuable additions to skincare routines aimed at enhancing skin health and appearance. (Anshul Sharma, 2023)

8. Paraffin Oil:

Paraffin oil, also known as liquid paraffin, is highly valued for its hydrating and protective properties. It works by forming a protective barrier on the skin's surface, which helps to trap moisture and prevent it from evaporating. This makes paraffin oil particularly beneficial for individuals with dry skin, as it helps to keep the skin hydrated and shielded from environmental elements. (Shankul Kumar, 2012)

❖ **Advantages of Herbal Cream:**

1. Herbal creams do not provoke allergic reactions and are free from any negative side effects.
2. They are easily absorbed into the skin and hair.
3. These creams are highly effective, even when used in small quantities.
4. Plant extracts used in herbal creams enhance the pharmacological effects of while reducing unnecessary bulk.
5. They are easy to source due to the availability and diversity of plant materials.
6. Herbal creams offer greater stability, purity, and efficacy due to their natural cosmetics.
7. Their production process is simple and cost-effective.
8. Storage and handling of herbal cosmetics are easier and ensure a prolonged shelf life.
9. They are economical and affordable. (Nisha Devi, 2018)

❖ **Disadvantages of Herbal Creams:**

1. **Slow Action**: Herbal medicines generally have a slower effect compared to allopathic (Conventional) dosage forms, often requiring long-term usage for noticeable results.
2. **Unpleasant sensory characteristics**: Herbal creams can be challenging to mask in terms of taste and odor, which may affect user compliance.
3. **Complex manufacturing process**: The manufacturing of herbal creams can be time consuming and complicated due to the variability of natural ingredients.

4. **Lack of standardization**: No specific pharmacopeia defines the procedures or ingredients to be used in herbal cosmetics, leading to inconsistent formulations.
5. **Risk of interactions and toxicity**: When herbal medicines are used alongside pharmaceutical drugs, there is a potential for interactions that can be harmful. Additionally, certain parts of plants may be edible while others are toxic, posing risks to users. (Annie Jerusha, 2021)

❖ **Applications:**

The effectiveness of herbal creams lies in their versatile therapeutic benefits for the skin. Enriched with antioxidants, vitamins, and phytonutrients, these creams help combat free Radicals, reduce inflammation, and promote skin repair and regeneration. Botanical extracts present in these formulations often exhibit antimicrobial, anti-inflammatory, and soothing properties. This makes herbal creams ideal for addressing various skincare concerns, ranging from dryness and irritation to acne and signs of aging. (Jayashri Modi, 2024)

Although primarily designed as facial moisturizers, herbal creams are highly versatile and serve multiple purposes. One of their most popular uses is as a makeup remover. Their rich oils gently dissolve makeup and dirt, allowing removal with minimal rubbing or scrubbing. Additionally, herbal creams can function as primers, as they soothe the skin and create an even surface for smoother makeup application.

Herbal cold creams are also effective as lip balms, body lotions, or even shaving creams. Applying cold cream to the lips helps lock in moisture and maintain hydration throughout the day, protecting the sensitive lip skin. Similarly, using moisturizing cold cream on the body delivers the same intense hydration as it does for the face, making it ideal for nourishing the arms, legs, back, and hands. (Anshul Sharma, 2023)

CHAPTER 2: AIMS & OBJECTIVES

AIMS AND OBJECTIVES

The herbal creams are cosmetic products consisting of natural ingredients along with some synthetic ingredients. These herbal creams may have anti-fungal, anti-bacterial, anti-acne properties and can also confer some advantages such as healing, soothing, conditioning and enhancing appearance of skin.

Therefore, following objectives were defined.

1. Determination of antimicrobial activity of *Tridax* leaf extract.
2. Formulation of herbal cream.
3. Evaluation of herbal cream

CHAPTER 3: REVIEW OF LITERATURE

REVIEW OF LITERATURE

- The demand for herbal-based cosmetics is growing due to their natural origins, minimal side effects, and enhanced efficacy in skincare. Herbal cosmetics, including face creams, provide essential nutrients and hydration to the skin, making them preferable to synthetic alternatives. Aloe vera and Crocus sativus (saffron), widely known for their skin-beneficial properties, are commonly employed in such formulations due to their nourishing, moisturizing, and anti-aging effects.

Several studies have highlighted the therapeutic benefits of Aloe vera and Crocus sativus in skincare formulations:

1.Aloe Vera: Renowned for its moisturizing, soothing, and anti-inflammatory properties, Aloe vera is extensively used in creams for hydration and acne reduction. Christaki and Florou-Paneri (2010) documented its multifaceted applications in cosmetics, highlighting its ability to heal skin irritations and improve skin elasticity.

2. Crocus Sativus: Saffron is well-recognized for its skin-lightening, anti-pigmentation, and scar-healing properties. Studies have validated its role in reducing melanin production and enhancing skin radiance, making it a popular ingredient in herbal face creams.

Herbal formulations undergo rigorous testing to assess their quality and performance like Physical Appearance, Washability, Greasiness, stability studies, Safety. Unlike synthetic creams, herbal face creams avoid harsh chemicals and synthetic preservatives, reducing the risk of side effects such as dryness, irritation, or allergic reactions. The combination of Aloe vera and saffron in herbal formulations delivers enhanced nourishment, making them ideal for multipurpose applications like moisturization, acne reduction, and anti-aging.

Existing literature emphasizes that herbal face creams formulated with natural ingredients like Aloe vera and Crocus sativus exhibit superior skin compatibility, stability, and user satisfaction. These formulations align with consumer demand for safe, effective, and eco-friendly skincare products, further solidifying their place in the cosmetic market. (Muggu Sankara Bhavani,2023)

- Herbal face creams have gained significant attention due to their minimal side effects, eco-friendliness, and therapeutic benefits. These formulations incorporate plant-based ingredients known for their antioxidant, antimicrobial, anti-inflammatory, and skin-nourishing properties. Commonly used herbs in face creams include Aloe vera, Turmeric, Neem, Sandalwood, and green tea.

1. Herbal Extracts includes:

Aloe vera, Turmeric (Curcuma longa), Neem (Azadirachta indica), Green tea (chamellia senensis).

2.Base Ingredients:

Emulsifying Agents: Beeswax, Moisturizers: Glycerin, shea butter etc.

Herbal face creams represent a promising alternative in the cosmetics industry, driven by their natural benefits and consumer preference for eco-friendly products. However, challenges related to formulation stability and standardization require further research to ensure widespread adoption

(CH. Naveena,2023)

- The remedies used to improve the persons look are called herbal cosmetics. The chemically active substances found in plants and secondary metabolites that can have a specific physiological effect on human body. The herbal cream has multiple uses like moisturizer, reduces acne, and skin irritation, reduces skin diseases like eczema, psoriasis, dry skin, wrinkles, rashes etc.

The cream was prepared by using a base consistency of beeswax, liquid paraffin, borax, methyl paraben, distilled water, rose oil, nirgundi and neem leaves also curcumin. The slab technique was used for cream formulation. Evaluation of cream was done to determine color, odor, texture, state, irritancy, wash ability, pH, greasiness properties.

The cream exhibited a multifunctional impact through the use of turmeric, neem and nirgundi. Throughout the trail period the produced formulation shown high consistency, good spreadabilty and no signs of phase separation.

(Supriya Bhosale,2024)

- An overview of herbal cosmetics, emphasizing their importance and growing global demand. These products are valued for their minimal side effects compared to synthetic alternatives. The historical roots of herbal cosmetics are traced to ancient Indian medical systems such as Ayurveda and Unani. The introduction highlights the need for safer, herbal-based cosmetic products due to the harmful effects of synthetic chemicals. It explains the objective of the study, which is to formulate a multipurpose herbal cream with properties like moisturizing, nourishing, and treating skin ailments.

The herbal cream was formulated using various natural ingredients such as Aloe Vera, Neem, Turmeric, Tulsi, and essential oils. The methodology involved aqueous extraction of the herbs followed by emulsification to create a stable cream base. Several tests like physical properties, thermal Stability, pH, spreadability, microbial growth, patch tests, stability studies were conducted to ensure the efficacy and safety of the cream.

The research concluded that the formulated herbal cream is a safe and effective alternative to synthetic cosmetics. It possesses desirable properties such as moisturizing, anti-wrinkling, and anti-microbial effects. The cream demonstrated stability and suitability for long-term use without any adverse effects (Akash Mali,2015).

- The preparation and evaluation of herbal antiseptic creams have garnered significant attention due to the increasing demand for natural and sustainable alternatives in dermatological formulations. Neem (*Azadirachta indica*), Tulsi (*Ocimum sanctum*), and Aloe Vera (*Aloe barbadensis* Miller) highlights the potential of these natural ingredients in creating an effective antiseptic cream for various skin conditions.

1. Topical Formulations and Creams:

Creams are semi-solid emulsions used for application to the skin or mucous membranes, serving therapeutic or cosmetic purposes. They are broadly classified as oil-in-water (O/W) and water-in-oil (W/O) emulsions, based on their phase composition. The formulation of creams incorporates active and inactive ingredients (excipients) such as stearic acid for emulsification, glycerin as a humectant, and preservatives like methylparaben to ensure microbial stability. The study under review utilized a systematic process to develop a stable herbal cream formulation, ensuring properties such as spreadability, viscosity, and stability.

2. Key Herbal Ingredients:

Neem (*Azadirachta indica*)-

Neem has been traditionally used for its antimicrobial, anti-inflammatory, and insect-repellent properties. Active constituents such as azadirachtin, nimbin, and quercetin exhibit antimicrobial and antiviral activity. Neem extracts have been incorporated into creams to treat infections, cuts, and wounds due to their potent antiseptic qualities. Scientific studies have demonstrated its efficacy in controlling bacterial growth and promoting skin healing.

Tulsi (*Ocimum sanctum*)-

Tulsi, revered for its antibacterial and immunomodulatory properties, contains eugenol, a phenolic compound responsible for its antimicrobial effects. It has been used extensively in Ayurvedic medicine for managing skin infections and enhancing wound healing. The study corroborates the role of Tulsi as a natural antiseptic in the formulation, contributing to its overall antimicrobial stability.

Aloe Vera (*Aloe barbadensis* Miller)-

Aloe Vera is renowned for its moisturizing, anti-inflammatory, and wound-healing properties. Its gel contains anthraquinones, polysaccharides, and glycoproteins, which aid in soothing and regenerating damaged skin. Its inclusion in topical formulations has shown significant improvement in hydration and reduced skin irritation. Aloe Vera's compatibility with other ingredients and its stability in emulsions make it a preferred choice for herbal creams.

3. Extraction Methods:

The extraction of bioactive compounds from Neem, Tulsi, and Aloe Vera is critical for their incorporation into formulations. Methods such as maceration and hot extraction were employed in the study to obtain ethanol-based extracts. These methods ensure the retention of active constituents, enhancing the cream's efficacy.

Evaluation Parameters of Herbal Creams the stability and efficacy of herbal creams are determined by various parameters, including pH, spreadability, viscosity, and microbial stability. of Li The study on herbal antiseptic cream highlights the efficacy and stability of Neem, Tulsi, and Aloe Vera as key ingredients. The formulation process and evaluation parameters reinforce the potential of herbal creams as safe and effective alternatives to synthetic antiseptics. Future research could focus on long-term clinical studies to further validate these findings and explore commercial scalability. (Suhani A. Shah,2023)

CHAPTER 4: MATERIALS & METHODS

MATERIALS AND METHODS

❖ Extract Preparation:

- **Collection of *Tridax procumbens* leaves-**

Tridax leaves were collected from the local botanical garden in Kolhapur.

- **Extraction of Powdered *Tridax* Leaves**

The collected *Tridax* leaves were thoroughly washed with distilled water to remove contaminants. The leaves were then chopped into small pieces and dried in a hot air oven for 3-4 days at 80^0C. After drying, the leaves were ground into a coarse powder using a mechanical mixer. A total of 10 g of powdered *Tridax* leaves was extracted using the maceration method with 100 ml of 70% ethanol as the solvent, with occasional shaking. The ethanolic extract of *Tridax* leaves was filtered and stored in airtight containers in a refrigerator at 4°C until further use.

- **Collection of Turmeric Rhizomes**

Turmeric rhizomes were collected from a herbal garden.

- **Extraction of Powdered Turmeric Rhizomes**

For the preparation of turmeric extract, 1 g of turmeric powder was mixed with 10 ml of distilled water in a 250 ml volumetric flask. The mixture was heated in a water bath at 80°C to 100°C for 5 to 10 minutes with continuous shaking. It was then filtered to obtain the turmeric extract.

- **Collection of Mint Leaves**

Mint leaves were collected from the local market in Kolhapur.

- **Extraction of Mint Leaves**

For the preparation of mint extract, 1 g of mint powder was mixed with 10 ml of distilled water in a 250 ml volumetric flask. The mixture was heated in a water bath at 80°C to 100°C for 5 to 10 minutes with continuous shaking. It was then filtered to obtain the mint extract.

- **Collection of Aloe vera plant**

Aloe vera leaves were collected from mature plants grown in a botanical garden, ensuring they were free from diseases and pest infestation.

- **Extraction of Aloe vera leaves**

Aloe vera leaves were harvested and thoroughly washed with distilled water to remove surface contaminants before being air-dried. The outer green rind was carefully removed lengthwise using a sterile knife, and the inner leaf pulp was filtered to extract the gel. Fibers and impurities were removed from the gel, which was then stored in the refrigerator until further use.

❖ Antimicrobial Activity of extract:

The anti-microbial activity of the extract in formulated cream was screened by well diffusion method in petri plate containing nutrient agar for bacteria (20ml media/plate)

The antimicrobial activity was tested against organisms such as *Staphylococcus aureus, Pseudomonas aeruginosa, Candida albicans, Klebsiella pneumoniae,* and *Salmonella typhi*. The bacterial suspension was prepared, and 0.1 ml of the suspension was spread over the nutrient agar plate. Using a cork borer, wells were created, and the extract in concentrations of 2%, 5%, and 10% of *Tridax procumbens* (Dagadi Pala) was inoculated at a volume of 0.1 ml per well. The plates were left for diffusion for 15 minutes and then incubated at 37°C for 24 hours.

❖ Formulation of Herbal Cream

For oil phase: Liquid parrafin and Beewax was heated in glass beaker and kept it in a water bath to melt and obtain clear solution.

For Water phase: In another beaker, adequate amount of plant extract, Pudina extract, turmeric extract, aloe vera extract, and glycerin was taken. This was added in beaker and placed in a water bath for mixing. After mixing, rose water and a few drops of lavender oil as a fragrance, then mixed uniformly until the cream was prepared.

Table No. 1: **Formulation of Herbal face cream**

Sr no	Ingredients	C 1	C 2	C 3
1.	Turmeric extract	2.4ml	1.8ml	2.2ml
2.	Pudina extract	2.4ml	1.8ml	2.2ml
3.	Tridax leaf extract	2.8ml	2ml	2.6ml
4.	Aloe Vera extract	2.4ml	2ml	2.5ml
5.	Bee Wax	5.5gm	5gm	4.9gm
6.	Paraffin oil	18ml	20ml	21ml
7.	Rose water	1.5ml	1ml	1.2ml
8.	Fragrance oil	1.5ml	2ml	2.5ml

❖ Evaluation of Herbal Cream

The evaluation of herbal cream involves several aspects to ensure its safety, efficacy, and quality. Below is an outline of the evaluation process:

1. **Physical Evaluation**:

The physical evaluation of herbal cream includes examining its appearance, texture, color, and odor.

i. **Color**: The color of the herbal cream depends on the ingredients used. If the color changes after a few days, it may indicate oxidation of the ingredients. This herbal cream formulation has a faint yellow color.

ii. **State**: The state of the herbal cream depends on the proportion of its phases. A good herbal cream should be stable and consistent. This particular herbal cream is semi-solid.

iii. **Consistency**: The cream should be smooth and homogeneous without visible clumping. Consistency was evaluated by manually rubbing a small amount of cream on the skin. This herbal cream is smooth and leaves a uniform layer on the skin.

iv. **Odor**: The Odor of the cream was found to be pleasant (Lavender)

2. **Irritability**: The cream was tested for irritability by applying it to the skin for 24 hours. After this period, no redness or inflammation was observed in the application area.
3. **Washability**: The Washability test was conducted by applying a small amount of cream to the hand and then rinsing it with tap water. All three Formulation were found to be easily washable.
4. **Greasiness**: This test is basically used to check nature of cream either oily or grease. According to results we can say that all formulations are Non greasy.

❖ **Additional Evaluation:**

5. **Determination of pH**: The pH of the cream is checked by dissolving 5 grams of cream in 50 ml of distilled water and measured with a pH meter.
6. **Phase Separation**: The prepared cream was packed in a dry container and stored in a dark area for 30 days to observe any phase separation. This test assesses the cream's ability to retain a uniform consistency and stability throughout its intended shelf life.
7. **After Feel**: The emollience, slipperiness, and amount of residue left after Applying fixed amount of cream was evaluated.
8. **Microbial Growth Test:**

a) The serial dilutions of the herbal cream were prepared in sterile glass tubes.

b) 0.1 ml of the sample was spread, inoculated on sterile Nutrient Agar (NA) plates.

c) For bacterial cultures, plates were incubated at 37°C for 24 hours. For fungal cultures, plates were incubated at 25°C for 4-5 days.

d) After incubation, plates were observed for any microbial growth to ensure product safety.

CHAPTER 5: RESULT & DISCUSSION

RESULT AND DISCUSSION

The herbal cream formulation includes medicinal plants such as *Tridax procumbens*, Aloe vera extract, mint extract, Turmeric and other ingredients known for enhancing skin glow and nourishment. Various quality control parameters, including physical appearance, pH, irritancy, washability, after-feel, phase separation, greasiness were thoroughly evaluated, with all parameters showing favorable results. The findings from this study suggest that incorporating these active ingredients into the herbal cream results in a stable product with strong aesthetic appeal.

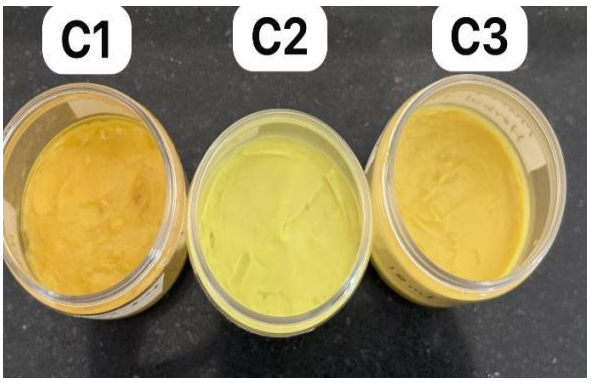
1. **Physical Evaluation:**

   The prepared formulation was evaluated for color, odor, and consistency. The color of the cream was observed visually and appeared faint yellow. The odor of the cream was pleasant (Lavender). The cream state was also examined visually and found to be semisolid in nature. The formulation's consistency was assessed by manually rubbing it on the hand, revealing a smooth texture

   Results are listed in table 2.

Table No. 2: Evaluation of physical parameter

Sr. no.	Parameter	C1	C2	C3
1.	Color	Faint yellow	Faint yellow	Faint yellow
2.	Odour	Pleasant	Pleasant	pleasant
3.	State	Semisolid	Semisolid	Semisolid
4.	Consistency	Smooth	Smooth	Smooth



Photograph No. 5: Physical evaluation of cream

2. **Irritability:**

   After the application of the Herbal cream in all formulation, the irritability test shows no indication of Irritation.

   Results are listed in table 3.

Table No. 3: Irritability test

Formulation	Formulation	Results
1.	**C1**	Non irritant
2.	**C2**	Non irritant
3.	**C3**	Non irritant

3. **Washability**:

   Formulation was applied on the skin and then ease extends of washing with water was checked.

   Results are listed in table 4.

Table No. 4: Washability test

Sr. no.	Formulation	Result
1.	C1	Easily Washable
2.	C2	Easily Washable
3.	C3	Easily Washable

4. Greasiness:

The cream was applied to the skin surface as a smear, and its texture was evaluated to determine whether it was oily or greasy. Based on the results, all three formulations were found to be non-greasy.

Results are listed in table 5.

Table no 5: Greasiness test

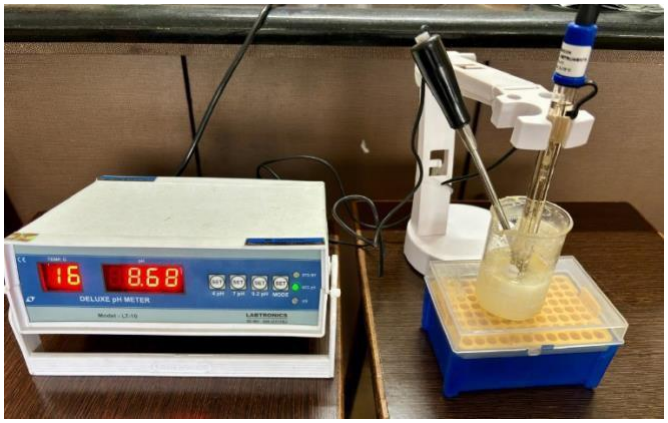
S. No	Formulation	Results
1	**C1**	Non greasy
2	**C2**	Non greasy
3	**C3**	Non greasy

5. Determination of pH:

The pH of the cream was measured with a pH meter. The pH of all the formulations was ranging from neutral to slight alkaline. Results are listed in table no 6

Table No. 6: Determination of pH

S.No	Formulation	pH
1.	**C1**	8.68
2.	**C2**	7.97
3.	**C3**	7.80



Photograph No. 6: Determination of pH

6. Phase Separation:

The phase separation was not observed for any of the formulation. The results of phase separation are listed in table no. 7

Table No.7: Phase Separation

Sr. No.	Formulation	Phase separation
1.	**C1**	No phase separation observed
2	**C2**	No phase separation observed
3.	**C3**	No Phase separation observed

7. After Feel:

The emolliency, slipperiness, and amount of residue left after applying a fixed amount of cream were found to be Good.

Results are listed in table no. 8

Table No.8 After Feel Test

S.No.	Formulation	After Feel
1.	**C1**	Good
2	**C2**	Good
3.	**C3**	Good

8. Microbial Growth Test:

The microbial growth test was conducted to determine total viable count (Bacterial and Fungal) in cream formulations.

The total Microbial count by standard plate count technique was found to be

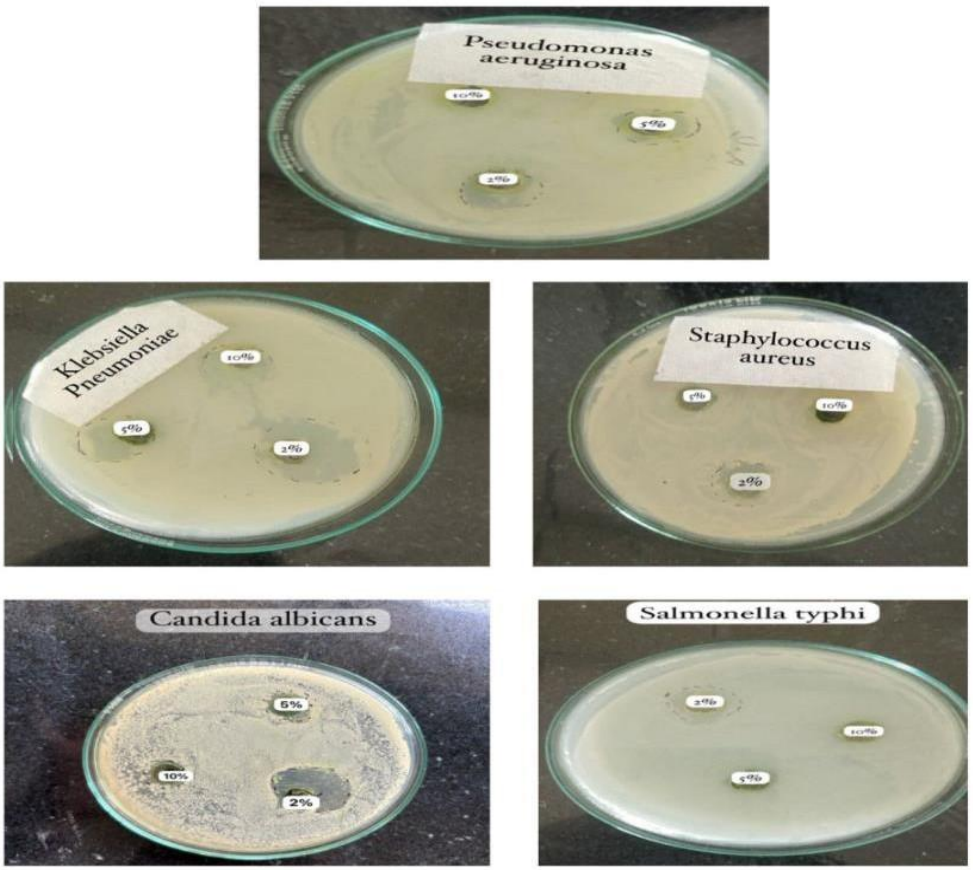
315×10^3 cfu/ml

9. Antimicrobial activity

The anti-microbial activity of the extract (*Tridax* leaves) in formulated cream was screened by well diffusion method and the observation were noted. The antibacterial as well as antifungal activity was confirmed.

Table No. 9: Antimicrobial activity

Sr. No.	Organism	Zone of Inhibition (Diameter in mm)
		2% alcoholic extract
1.	*Staphylococcus aureus*	9 mm
2.	*Pseudomonas aeruginosa*	21mm
3.	*Salmonella typhi*	15mm
4.	*Klebsiella pneumoniae*	25mm
5.	*Candida albicans*	25mm



Photograph No. 7: Antimicrobial Activity of Extract

CHAPTER 6: SUMMARY & CONCLUSION

SUMMAY AND CONCLUSION

The herbal cosmetics are defined as beauty products which possess desirable physiological activities like healing, conditioning, smoothing appearance because of herbal ingredients. The herbal is basically water in oil type of emulsion. Now –a-days the usefulness of herbs in the cosmetical production has been increased extensively in personal care system and there is great demand for it also.

The cream was formulated in stepwise manner. The liquid paraffin and beeswax were mixed in glass beaker and then heated in water bath ton melt obtain clear solution. After heating, rose water and few drops of lavender oil was added and mixed uniformly. Finally, the extract of *Tridax* leaves, turmeric and aloe vera was added in the formulation.

The evaluation of herbal cream was done to ensure its safety, efficacy and quality. The physical evaluation was done to determine appearance, texture, color and odor of cream. Similarly, its irritability, washability, greasiness, pH, after feel properties were determined.

The antimicrobial activity of *Tridax* leaf extract was also determine by well diffusion method. Satisfying results as per the pre-decided aims and objectives were obtained. However, furthers application study of herbal cream in different conditions is necessary.

CHAPTER 7: BIBLIOGRAPHY

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CHAPTER 8: APPENDIX

APPENDIX

Nutrient Agar Medium:

Composition:

Sr. No.	Ingredients	Amount
1	Peptone	1gm
2	NaCl	0.5gm
3	Meat extract	0.3gm
4	Agar-agar	15gm
5	pH	7.2
6	Distilled Water	100ml

MACCONKEYS AGAR MEDIUM:

COMPOSITION:

Sr. No.	Ingredients	Amount
1	Peptone	20gm
2	Lactose	10gm
3	Bile salt	1.5gm
4	NaCl	5gm
5	Neutral red	0.03gm
6	Agar-agar	13.5
7	Crystal violet	0.001gm
8	pH	7.2
9	Distilled Water	1000ml

MHA (Mueller-Hinton Agar)

Medium: Composition:

Sr. No.	Ingredients	Amount
1	Bees wax	0.2gm
2	Tryptophan	1.75gm
3	Starch	0.15gm
4	Agar-agar	1.7gm
5	Distilled Water	100ml